



COMMONWEALTH OF VIRGINIA

Department of Mines, Minerals and Energy

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MEMORANDUM DM 05-08

TO: All Virginia Surface Coal Mine Operators

FROM: Frank A. Linkous
Frank A. Linkous, Chief
Division of Mines

SUBJECT: *Surface Mine Maps*

DATE: November 16, 2005

On February 10, 2005, the Governor signed into law House Bill 2573, which included significant changes to Section 45.1-161.64 of the Coal Mine Safety Laws of Virginia, pertaining to surface mine maps. Previously, surface mine operators only submitted surface mine maps to the Department of Mines, Minerals and Energy (DMME) when intersecting abandoned mine workings. This section of the law now requires all surface mine operators to submit a map "prior to commencing mining activity"; "at intervals not to exceed 12 months"; and "when a coal mine is abandoned". The information these maps must contain is also described in detail in Section 45.1-161.64(G), a copy of which is attached for your review.

While the requirements adopted are principally the same as those contained in the Federal regulations, several questions have arisen as a result of these changes:

1. *When must surface mine maps be submitted?*

Surface mine operators who have submitted mine maps within the past 12 months will be notified, as usual, by mail when their maps are due. If you have not submitted a surface mine map within the past 12 months, you will be notified by mail on the anniversary day of the mine license.

2. *What is an accurate and up-to-date map of the mine?*

An accurate and up-to-date map of the mine is a map that meets all requirements of Section 45.1-161.64.G of the Coal Mine Safety Laws of Virginia. An itemized list of

these requirements for surface mine maps has been included in Attachment A. Pertinent aspects of these requirements are discussed in the questions and answers that follow. An accurate and up-to-date map of the mine meeting these same requirements must also be maintained at the mine site.

3. *What are the property or boundary lines of the active areas of the mine and how much should be shown on the mine map?*

Generally, for a surface mine, the boundary lines are the permit boundaries. Some mines have multiple permit boundaries or the permitted area is so large that much of the area may not be mined for several years. The revised law does not specifically state that all of the property or boundary lines must be shown on a map of the mine; rather, the law requires that the property or boundary lines of the “active areas” of the mine be shown. For maps submitted to the DMME or maintained at the mine, showing the property or boundary lines within 1,000 feet of the active workings or within 1,000 feet of the projected mining in the next 12 months will be sufficient.

4. *How must contour lines of elevations be shown?*

Paragraph 45.1-161.64.G.3 requires contour lines passing through whole number elevations of the coalbed being mined. It includes spacing requirements and the provision that contour lines may be placed on an overlay. Since most surface mine maps are submitted on topographical maps, showing the coalbed contour elevations on them may make them difficult to interpret and utilize. If the operator chooses to submit separate maps showing the underground mine workings they will be mining through (see question 5 below), coalbed contour lines may be placed on them. If there are no underground mine workings, and the only known coalbed elevations are the pit elevations, the operator may state in the cover letter or on the map that not enough information exists to develop coalbed contour lines. The operator also may elect to implement either of these options for the map maintained at the mine. Paragraph 45.1-161.64.G.4 requires showing a general elevation of the coalbeds being mined and the general elevation of the surface. If the surface mine map is a topographical map, then the surface elevation contours will suffice for the general elevation of the surface.

5. *What bodies of water must be shown?*

Paragraph 45.1-161.64.G.6 requires showing the location and elevation of “any body of water dammed or held back in any portion of the mine”. This paragraph allows the bodies of water to be shown on a separate overlay or tracing. Any pond or impoundment constructed on the site by the mine must be shown. Bodies of water impounded by any abandoned underground mines are excluded from this requirement. However, if underground impoundments are known, operators are encouraged to show them in order to decrease the potential for an uncontrolled release of water in the event of an accidental hole through.

6. *What do we need to keep for daily notations?*

Section 45.1-161.64.G does not specifically require temporary notations to be made for surface mines as does section 45.1-161.64.E for underground mines. This paragraph does require the map to show all auger and strip mined areas of the coalbeds being mined. Also, all worked out and abandoned areas must be shown. Surface mining activity such as development of coal pits, auger holes, or highwall miner holes must be noted on the map as they are completed. It is important, particularly when mining in red zones, for the surface mine foremen and workers to know where they are conducting ground disturbing activities in relationship to the many potentially hazardous contacts surrounding a surface mine such as public roads, residences, gas wells and pipelines, and power transmission lines.

7. *How can we show all underground mine workings on the map?*

As these maps are required to show underground mine workings “underlying” and “within 1,000 feet of the active areas of the mine”, it is likely that the maps will become quite busy and difficult to maintain as well as to comprehend. Therefore, surface mine operators, if they choose, may elect to submit a set of overlays and underlays of the underground mine workings to keep on file at DMME. The overlays must include maps of the underground workings within the planned mining horizon of the surface mine and below. These overlay or underlay maps will not have to be updated annually unless changes occur to the underground mine workings.

8. *What other information does the Chief require?*

This section of the law also allows the Chief to require other information to be shown on the surface mine map. Attached is the list of requirements that must be shown on the maps submitted to the DMME and maintained at the mine. Each notification letter will also include a copy of this list.

Currently, the Chief requires that all surface mine maps contain at least four points labeled with the state plane coordinate system (NAD27). Of course, if the coordinate system on the map is already the NAD 27 state plane coordinate system, this requirement is met. Section 45.1-161.64.A requires that all maps, beginning July 1, 2007, to be presented on the Virginia Coordinate System of 1927, South Zone, unless otherwise approved by the Chief.

All surface mines are now required to have a ground control plan approved by the Chief. These ground control plans must include a map of “red zones” which depict work areas that represent a potential hazard to the public. The Chief now requires all surface mine maps to show the approved red zone areas on the map.

9. *How often does a surface map at the mine site have to be updated?*

Section 45.1-161.64 does not specifically state when or how often that mine maps must be updated at the mine site. However, the DMME requires that, in each mine's approved ground control plan, there will be a statement that the map of the mine will be updated every six months and that the map will be certified by registered professional engineer or certified land surveyor. Failure to do so will constitute a violation of the approved ground control plan.

10. *Does a surface mine have to submit a final map?*

Yes, Section 45.1-161.64.A pertains to all mines. All mines must submit a map prior to commencing mining activity, at intervals not to exceed every 12 months, and when it is abandoned.

11. *Do highwall miners or augers have to submit maps?*

Yes, Section 45.1-161.64.A again pertains to all mines. Mine operators may choose to submit the highwall miner or auger on the same map as the surface mine.

Maps maintained at the mine site should, in most cases, contain the same information as a map submitted to the DMME. The format of the information can take the same format as that of the submitted map, e.g., underground mine workings in the mining horizon can be shown on separate overlays kept on file at the mine site.

We hope the answers to these questions will prove helpful in developing your surface mine maps for submittal to the DMME and to be maintained at the mine site. If you have further questions or need additional explanation, please contact Mike Willis, DM Mine Safety Engineer, at 276-523-8231 or email mike.willis@dmme.virginia.gov, or any of the specialists at our Big Stone Gap office (276-523-8229) or our Keen Mountain office (276-468-4553).

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Enclosure

Attachment A

Mapping Requirements for Surface Coal Mines

Section 45.1-161.64 of the Coal Mine Safety Laws of Virginia requires mine maps to be submitted prior to commencing mining activity, at intervals not to exceed twelve (12) months, and when a mine is abandoned. Annual maps must be up-to-date and certified by a registered engineer or registered surveyor. If there have been no changes since the last submittal, maps are not required, however, written notification that no changes have occurred should be forwarded to the Department of Mines, Minerals and Energy.

Annual surface mine maps must include the following:

- Scale between 100 ft. and 500 ft. to 1 inch with the scale noted on the map.
- Posted date.
- Mine name, company name, Mine Index #, and DMLR Surface Mining Permit #.
- Legend and symbols used.
- Property lines, permit lines, and outcrop within 1,000 feet of the active areas of the mine.
- All auger and strip-mined areas of the coalbeds being mined.
- Active and worked out areas of the mine.
- Mining projections, including the sequence of mining, for at least 12 months.
- Location of gas wells, gas lines, vertical ventilation holes, and all known drill holes within the permit boundary and within 500 feet of the mine.
- Elevations of the coalbeds mined.
- The location of underground mine workings or workings from auger, thin seam, or highwall mining operations that are within 1,000 feet of the active areas of a mine.
- Location of any body of water dammed or held back in any portion of the mine.
- Location of railroads, public highways, and primary access roads leading to the mine and permanent mine buildings.
- The location and description of at least two permanent baseline points and the location and description of at least two permanent elevation benchmarks.

The Chief may require other information to be shown on the surface mine maps.

- Four points, labeled with Virginia Coordinate System of 1927, South Zone, located on the map to encompass the entire mine workings (or the use of this coordinate system on the map).
- Location of “Red Zone” work areas as required by the surface mine operation’s approved ground control plan.

Attachment B

45.1-161.64 Code of Virginia.

- A) Prior to commencing mining activity, the operator of a coal mine, or his agent, shall make, or cause to be made, unless already made and filed, an accurate map of such mine. Beginning July 1, 2007, all maps shall be presented on the Virginia Coordinate System of 1927, South Zone, unless otherwise approved by the Chief. At intervals not to exceed twelve 12 months and when a coal mine is abandoned, the operator shall submit to the Chief three copies of an up-to-date map of the entire mine in paper format or one copy of the map in an electronic format. On and after July 1, 2007, only maps in an electronic format will be accepted unless otherwise approved by the Chief. If there are no changes in the information required to be submitted under this section at the time an updated map is due, the operator may submit a notice that there are no changes to the map in lieu of submitting an updated map to the Department.
- B) Underground coal mine maps shall show:
1. The active workings;
 2. All pillared, worked out, and abandoned areas, except as provided in this section;
 3. Entries and air courses with the quantity of airflow, direction of airflow indicated by arrows, and ventilation controls;
 4. Contour lines of all elevations;
 5. Dip of the coalbed;
 6. Escapeways;
 7. The locations that are known or should be known of:(i) adjacent mine workings within 1,000 feet (ii) mines above or below, and (iii) water pools above;
 8. Either producing or abandoned oil and gas wells located within 500 feet of such mine and in any underground area of such mine; and
 9. Such other information as the Chief may require.

Such map shall identify those areas of the mine that have been pillared, worked out, or abandoned, which are inaccessible, or cannot be entered safely.

- C) Additional information required to be shown on underground coal mine maps shall include:
1. Mine name, company name, mine index number, and name of the person responsible for information on the map;
 2. The scale and orientation of the map and symbols used on the map;
 3. The property or boundary lines of the mine;
 4. All known drill holes that penetrate the coalbed being mined;
 5. All shaft, slope, drift, and tunnel openings and auger and strip mined areas of the coalbed being mined;

6. The location of all surface mine ventilation fans; the location may be designated on the mine map by symbols;
 7. The location of railroad tracks and public highways leading to the mine, and mine buildings of a permanent nature with identifying names shown;
 8. The location and description of a least two permanent base line points coordinated with the underground and surface mine traverses, and the location and description of at least two permanent elevation bench marks used in connection with establishing or referencing mine elevation surveys;
 9. The location and elevation of any body of water dammed or held back in any portion of the mine; provided, however, such bodies of water may be shown on overlays or tracings attached to the mine maps used to show contour lines as provided under subdivision 12 of this section;
 10. The elevations of tops and bottoms of shafts and slopes, and the floor at the entrance to drift and tunnel openings;
 11. The elevation of the floor at intervals of not more than 200 feet in (i) at least one entry of each working section and main and cross entries; (ii) the last line of open crosscuts of each working section, and main and cross entries before such sections and main and cross entries that are abandoned; and (iii) rooms advancing toward or adjacent to property or boundary lines or adjacent mines; and
 12. Contour lines passing through whole number elevations of the coalbed being mined. The spacing of such lines shall not exceed 10-foot elevation levels, except that the Chief may approve a broader spacing of contour lines for steeply pitching coalbeds. Contour lines may be placed on overlays or tracings attached to mine maps.
- D) Underground coal mine maps submitted to the Chief shall be on a scale of not less than 100 or more than 500 feet to the inch. Mapping of the underground mine works shall be completed by a closed loop survey method of traversing or other equally accurate methods of traversing. All closed loop surveys shall meet a minimum accuracy standard of one part in 5,000. Elevations shall be tied to either the United States Geological Survey or the United States Coast and Geodetic Survey benchmark system. A registered engineer or licensed land surveyor shall certify that the map of the mine workings is accurate.
- E) Underground coal mine maps shall be kept up-to-date by temporary notations and revised and supplemented at intervals not to exceed six months based on a survey made or certified by a registered engineer or licensed land surveyor. Temporary notations shall include:
1. The location of each working face of each working place;
 2. Pillars mined or other such second mining;
 3. Permanent ventilation controls constructed or removed, such as seals, overcasts, undercasts, regulators, and permanent stoppings, and the direction of air currents indicated; and
 4. Escapeways designated by means of symbols.
- F) At underground coal mines, an accurate map of the mine showing clearly all avenues of ingress and egress in case of fire shall be posted in a place accessible to all miners.

- G) Surface mine operators shall maintain an accurate and up-to-date map of the mine. The map shall show:
1. Name and address of the mine;
 2. The property or boundary lines of the active areas of the mine;
 3. Contour lines passing through whole number elevations of the coalbed being mined. The spacing of such lines shall not exceed 25-foot elevation levels, except that the Chief may approve a broader spacing of contour lines for steeply pitching coalbeds. Contour lines may be placed on overlays or tracings attached to mine maps;
 4. The general elevation of the coalbed or coalbeds being mined, and the general elevation of the surface;
 5. Either producing or abandoned oil and gas wells and gas transmission lines located on the mine property;
 6. The location and elevation of any body of water dammed or held back in any portion of the mine: provided, however, such bodies of water may be shown on overlays or tracings attached to the mine maps;
 7. All prospect drill holes that penetrate the coalbed or coalbeds being mined on the mine property;
 8. All auger and strip mined areas of the coalbed or coalbeds being mined on the mine property together with the line of maximum depth of holes drilled during auger mining operations;
 9. All worked out and abandoned areas;
 10. The location of railroad tracks and public highways leading to the mine, and mine buildings of a permanent nature with identifying names shown;
 11. Underground mine workings underlying and within 1,000 feet of the active areas of the mine;
 12. The location and description of at least two permanent baseline points, and the location and description of at least two permanent elevation bench marks used in connection with establishing or referencing mine elevation surveys;
 13. The scale of the map; and
 14. Such other information required by the Chief.
- H) Surface surveys shall originate from at least two permanent survey monuments on the mine property located with a minimum accuracy standard of one part in 10,000. The monuments shall be clearly referenced on the mine map. Elevations shall be tied to either the United States Geological Survey or the United States Coast and Geodetic benchmark system.
- I) The original map, or a true copy thereof, shall be left by the operator at the active mine, open at all reasonable times for the examinations and use of the mine inspector.
- J) Such maps may be used by the DMME for the evaluation of the coal resources of the Commonwealth.

- K) The map shall be filed and preserved among the records of the Department and copies of such maps shall be made available at a reasonable cost.
- L) Any person who has conducted mining operations or prepared mine maps and who has a map or surveying data of any worked out or abandoned underground coal mine shall on request make such map or data available to the Department to copy or reproduce such material.